

A
(c) treating the pulp in the acid tower at substantially the pH, between 2-6, to which it has been adjusted in step (a), at a pressure of 0-20 bar, at a temperature of 75-130°C, and for 20-240 minutes, so [as to] that acid treatment decreases the kappa number by 1-9 units;

(d) transferring the pulp from the acid tower to the tower of the second treatment stage,

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(e) in the second treatment stage tower treating the pulp with a complexing agent at a pH of between 4-9;

P or OP
(f) washing, pressing, or both washing and pressing the pulp; and

(g) bleaching the pulp with hydrogen peroxide using 5 to 20 kg peroxide/adt and 0 - 15 kg oxygen/adt.

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19. (Amended) A method as recited in claim 17 wherein step (e) is practiced using chlorine dioxide[, Caro's acid, peracids, or combinations thereof] prior to or in combination with the complexing agent.

Claim 17, line 2, delete "at a pressure of 1-10 bar,";

lines 2 and 3, change "as to decrease" to -- that acid treatment decreases--.

Cancel claims 20, 23 and 31 without prejudice.

Claims 30 and 32, line 1 of each, change "20" to --16--.

Add the following new claims:

36. A method of pre-treating, prior to bleaching with peroxide, cellulose pulp, to improve bleachability of the pulp, using an acid tower, and a tower in a second treatment stage, comprising the steps of substantially sequentially:

(a) if necessary, adjusting the pH of the pulp to between 2-6 by adding aminic acid, sulfuric acid, hydrochloric acid or another acid which does not contain oxidizing perhydroxyl ions;

(b) feeding the pulp to the acid tower;

(c) treating the pulp in the acid tower at substantially the pH, between 2-6, to which it has been adjusted in step (a), at a pressure of 0-20 bar, at a temperature of 75-130°C, and for 20-240 minutes, so that acid treatment decreases the kappa number by 1-9 units;

(d) transferring the pulp from the acid tower to the tower of the second treatment stage,

(e) in the second treatment stage tower treating the pulp with chlorine dioxide and adding chemicals to the pulp to adjust the metal profile of the pulp prior to, or in combination with, the chlorine dioxide treatment;

(f) washing, pressing, or both washing and pressing the pulp; and

(g) bleaching the pulp using hydrogen peroxide.

37. A method as recited in claim 36 wherein step (c) is practiced at a pH between about 3 - 4, at a temperature of 80-110°C, for a time of 30-180 minutes, and so that acid treatment decreases the kappa number of the pulp by at least 2 units.

- 2b1 38. A method as recited in claim 37 wherein step (e) is practiced using a complexing agent at a pH of between about 4 – 9.
39. A method as recited in claim 36 wherein step (g) is practiced by treating with hydrogen peroxide alone in a stage, or by adding hydrogen peroxide to an alkaline stage.
40. A method as recited in claim 38 wherein prior to step (e), between steps (c) and (e), adding acid or alkali to the pulp to adjust the pH thereof.
41. A method as recited in claim 36 wherein step (f) is practiced by washing the pulp in a fractionating washer so that a first filtrate containing heavy metals is removed from the process, and a second, cleaner, filtrate is recycled for use in another stage of the method.
42. A method as recited in claim 36 wherein step (g) is practiced using two towers which are different in size and connected to each other, the first tower acting as a pretreatment reactor and the second tower as a bleach tower.
43. A method as recited in claim 42 wherein step (g) is further practiced by: mixing peroxide with the pulp; feeding the pulp into the pretreatment reactor and treating the pulp in the pretreatment reactor at a pressure of 3-20 bar and for a reaction time of 10-60 minutes, so that the peroxide reacts with the pulp; separating gas from the pulp; using the pressure in the pretreatment reactor, blowing the pulp to a lower section of the bleach tower so that the pulp flows upwardly in the bleach tower; and